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PRESSURELESS™ OZONE WATER PURIFICATION SYSTEMS

## Ozonation System Installation Caldwell Zoo, Tyler, Texas

*Founded in 1937, Caldwell Zoo is now one of the finest small zoos in the country, attracting more than 600,000 visitors each year. The zoo is home to 2,000 animals of 250 different species. The zoo promotes education and research in conservation issues and participates in breeding programs, including those for endangered species.*



### CHALLENGE

As part of a major renovation project, the zoo planned to recycle the water from flamingo and spoonbill pools. Safety for humans, animals, and aquatic life was a major requirement for the new recycling treatment system.

### SOLUTION

A Model N-60 Ozonation System installed at the zoo produces ozone from ambient air— instead of from pure oxygen, which can be hazardous. The Ozonation System mixes the ozone with recycled pool water in a contact tank, purifying the water. The purified water is then returned to the pools.

An ozone off-gas destruct unit converts any undissolved ozone to oxygen and discharges it harmlessly to the outside air.

### RESULTS

The Ozone Technology Model N-60 Ozonation System is safely, efficiently, and dependably treating the recycled water from the flamingo and spoonbill pools.

### BENEFITS

- Improves zoo visitor experience by dramatically reducing odor and producing clear, beautiful water.
- Creates a healthy environment for the birds.
- Eliminates water-borne bacteria and viruses.
- Saves water by reducing the need to draw down exhibit water to remove solids.
- Produces a safer environment for birds by eliminating the need for chlorine and other hazardous biocides.



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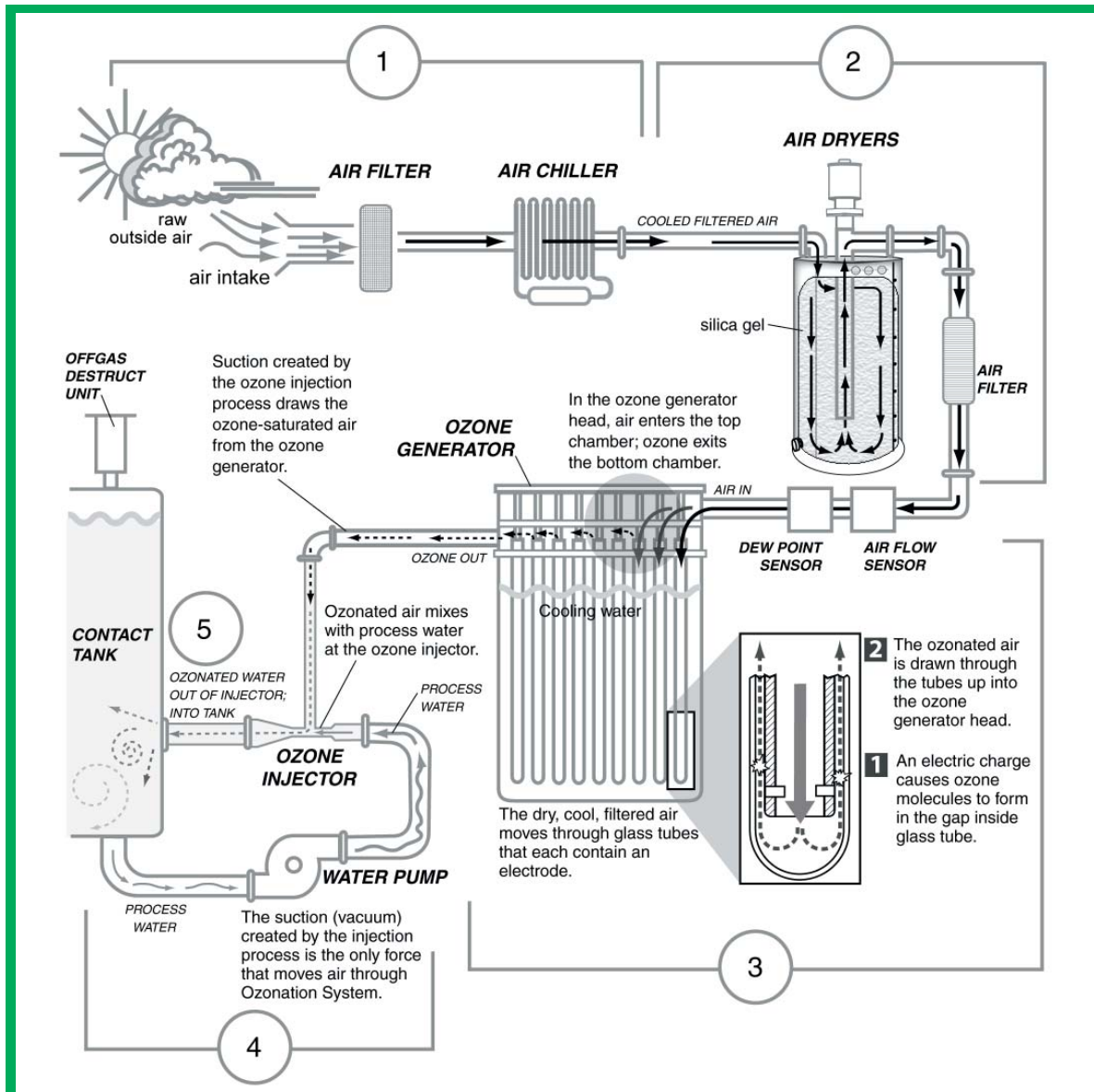
### TECHNICAL INFORMATION

#### Model N-60 Ozonation System Theory of operation

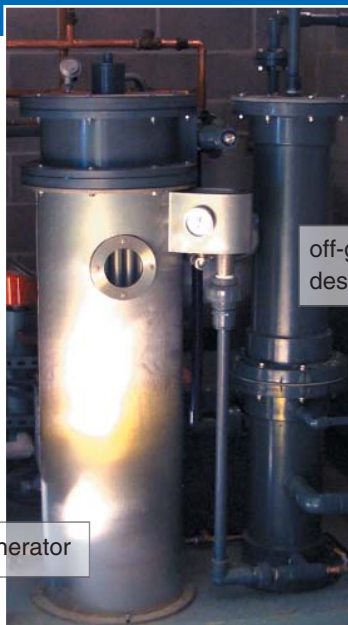
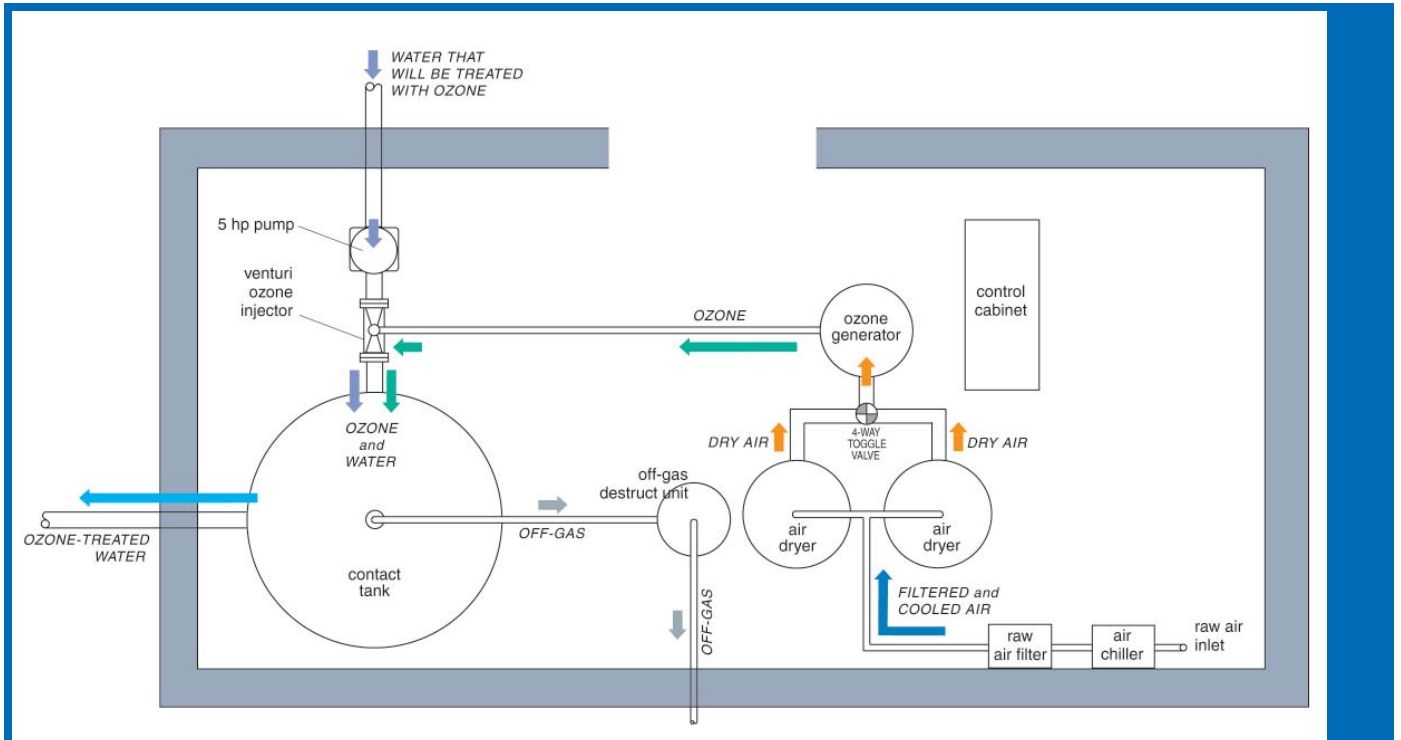
Ambient air is cooled and dried. The air then enters an ozone generator, where ozone is produced. Suction from a venturi ozone injector pulls the ozone from the generator and mixes it with recycled exhibit pool water in a contact tank.

An ozone off-gas destruct unit converts any undissolved ozone to oxygen and discharges it to the outside air. Filter backwash is discharged into a city sewer pipe.

The Model N-60 Ozonation System is completely pressureless, enhancing safety and greatly reducing maintenance. The suction (vacuum) created by the venturi injector is the only force that moves air through the system.



**Plan View–Simplified Diagram  
Model N-60 Ozonation System Installation  
Caldwell Zoo**



*“The Ozone Technology system works great. The flamingo exhibit water is clear and odor free. I’m very pleased.”*

— Roger Boggs,  
Manager of Operations,  
Caldwell Zoo

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### TECHNICAL SPECIFICATIONS

#### General system specifications

Ozone produced	60 grams per hour (3.2 pounds per day) of 2% ozone from ambient air
Total flow rate	800 gpm
Ozone treatment side-stream flow rate	150 gpm
Ozonation contact tank size	600 gallon
Ozonation and off-gas destruct time	4 minutes

#### Ozone Generation subsystem specifications

Number of ozone generators	1
Ozone output	60 gr/hr
Ozone concentration	24 gr/m <sup>3</sup> (2% wt)
Gas flow to ozone generator (@60 gr/hr)	2.5 m <sup>3</sup> /hr (1.47 cfm)
Cooling water required (@60 gr/hr)	120 lph (0.6 gpm) at 45 psi (maximum)
Cooling water temperature at inlet to ozone generator	70°F (21.1°C) nominal
Supply voltage	460 VAC, 3 phase, 60 Hz
Control voltages	24 VDC and 120 VAC
High voltage	10,200 VAC (maximum)
Number of high voltage electrodes in ozone generator	42

#### Air Preparation subsystem specifications

Number of air dryers	2
Dryer type	Non-pressurized desiccant (negative pressure)
Air drying capability	-40°F dew point or better
Desiccant type	Granular silica gel
Dryer operation cycle time (between changes)	Equivalent of 36 hours operation at full output
Dryer regeneration time	8 hours (maximum) heating plus 28 hours (minimum) cooling
Dryer heater power	2,000 watts, 120/240 VAC, 3-phase, 60 Hz
Regeneration air inlet temperature	Room ambient
Regeneration air outlet temperature	Approximately 240°F (116°C)

#### Ozone Injection subsystem specifications

Number of ozone injectors	1 (1½-inch KYNAR)
Number of ozone injector pumps	1
Ozone injector pump power (from ozone generator control cabinet)	5 hp (460 VAC, 3-phase, 60 Hz)

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